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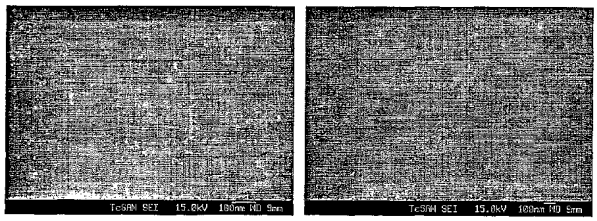
(54) Title: METALLIC NANO-PARTICLES AND DISCRETE POLYMER-COATED NANO-PARTICLES



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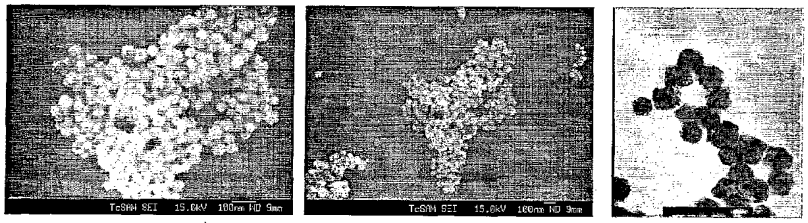

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(57) Abstract: Nano-structures are disclosed that are ideally suited for microelectronics, medical treatment, drug-delivery systems, targeted thermal absorption media, or other similar applications, where the nano-particles include metal oxide nano-particles and metallic nano-particles including a metallic nano-shell or metallic nano-rods deposited on the surface of the nano-particles or nano-shell nano-particles including metallic nano-rods deposited on the surface of the nano-particles and where the nano-structures have a plasmon resonance. For *in vivo* medical applications, the plasmon resonance is tuned to a tissue-transparent frequency range. Hydrogel-coated nanostructures are also disclosed, which are capable of transitioning between a non-collapsed hydrogel and a collapsed hydrogel via thermal activation induced by electromagnetic irradiation.

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